Cisco 16-Port EtherSwitch Network Module for Cisco 2600/3600/3700 Series Routers

The Cisco 16-port 10/100 EtherSwitch Network Module (NM) for Cisco 2600, 3600, and 3700 series modular multiservice router offers branch office customers the option to integrate switching and routing in one platform. This combination offers ease of configuration, deployment and management while utilizing the powerful characteristics of Cisco routing and Catalyst switching features.

The 16-port Cisco EtherSwitch NM is a modular, high-density network module that provides line-rate Layer 2 switching across Ethernet ports using Cisco IOS® Catalyst Software. The Cisco EtherSwitch NM has sixteen 10/100 switched Ethernet ports, with options for in-line power and a single Gigabit Ethernet port. Expected features such as port autosensing, QoS and VLAN support from 802.1P and 802.1Q standards, and 802.1D Spanning Tree protocols are standard on the Etherswitch module.

The Cisco EtherSwitch Network Module is available in a 16-port 10/100BaseTX switch module and a 16-port 10/100BaseTX switch with an in-line power daughter-card module. The in-line power Cisco EtherSwitch NM can power Cisco IP phones or Cisco wireless access points. In-line power requires an external power supply. Each of these two network modules can accept a single-port Gigabit Ethernet daughter card. (See Figures 1 and 2.)

Figure 1 16-Port Cisco EtherSwitch Network Module for the Cisco 2600/3600/3700 Series (pictured with optional Gigabit Ethernet port)

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Figure 2 Cisco 2600/3600/3700 Series with EtherSwitch Network Module

EtherSwitch Network Module Summary

- NM-16ESW—Cisco 16-Port 10BaseT/100BaseTX Autosensing EtherSwitch Network Module
- NM-16ESW-PWR—Cisco 16-Port 10BaseT/100BaseTX Autosensing EtherSwitch Network Module with power daughter card*

*This 16-port version should be ordered only if you require in-line power. You must have or order an external power unit to support in-line power.

Options

- PWR-Chassis-360W—Four-port power chassis that provides external power for NM-16ESW-PWR; this power chassis includes one 360W power supply and has three open slots for expansion
- GE-DCARD-ESW—Optional 10/100/1000BaseT Gigabit Ethernet port for NM-16ESW and NM-16ESW-PWR
- PPWR-PS-360W—Single 360W power supply for Cisco EtherSwitch Network Module line

Platform Support

- Cisco 2600 Series—Supports one Cisco EtherSwitch Network Module; maximum 16 ports
- Cisco 3620 Series—Supports one Cisco EtherSwitch Network Module; maximum 16 ports
- Cisco 3640 Series—Supports two Cisco 16-port EtherSwitch Network Module; maximum 32 ports*
- Cisco 3660 Series—Supports two Cisco 16-port EtherSwitch Network Module; maximum 32 ports*
- Cisco 3700 series - Supports two Cisco 16-port Etherswitch module, maximum 32 ports*

Each Cisco EtherSwitch Network Module can have a single Gigabit Ethernet port option. This option is required for intra-chassis stacking.

* Cisco IOS release 12.2(11)T supports up to 2 modules per chassis. The modules must include the GE-DCARD-ESW which is used to stack the modules externally to the chassis.

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Features and Benefits

Table 1 Features and Benefits of Cisco EtherSwitch Network Module

Features	Benefits
Sixteen 10BaseT/100BaseTX Ports	Delivers up to 200 Mbps of bandwidth (full duplex) Layer 2; forwards and filters at full wire speed on each port
Autosensing on Each Port	Detects the speed of the attached device and automatically configures the port for 10- or 100- Mbps operation
Integrated Switching	Provides fewer points of management for remote and small branch offices
Support for 802.1P QoS	Supports QoS based on the Institute of Electrical and Electronics Engineers (IEEE) class-of-service (CoS) and port-based prioritization, allowing the switch to change the CoS settings of tagged packets on a per-port basis
802.1Q Trunking	Allows the setup of separate VLANs with tagged and untagged framing; trunking is used to save ports when creating a link between two devices implementing VLANs
802.1D Spanning Tree (a Layer 2 link-management protocol that provides path redundancy while preventing undesirable loops in the network)	Simplifies network configuration and improves fault tolerance
Voice Virtual LAN (VLAN) Feature for IP Phones	Enables phones to be placed into their own VLANs without the need for end-user intervention; a user can plug the phone into the switch, and the switch provides the phone with the necessary VLAN information
Port-Based Reclassification for Queues on Each 10/100 That Are Configurable Using a Weighted Round Robin (WRR) Scheduler	Enables users to prioritize mission-critical traffic, such as VoIP and IP-based video applications over regular traffic
Media Access Control (MAC)-Based Port-Level Security	Prevents unauthorized stations from accessing the switch; Cisco fully supports the entire set of Requests for Comments (RFCs)
Multifunction LEDs per Port for Port Status	Provide a comprehensive and convenient visual management system
Cisco IOS Command-Line Interface (CLI)	Provides configuration through Cisco IOS CLI and provides common user interface for all the router functions
Multicast Management Support	Offers Internet Group Management Protocol (IGMP) snooping in hardware for management support
32 MB of DRAM	Features 4-/8-MB shared-memory architecture that is shared across all ports
SNMP Management	Offers support for Simple Network Management Protocol (SNMP) Management Information Base (MIB) manageable via a MIB browser
In-line Power (optional)	EtherSwitch with the external power chassis can power Cisco IP Phones and wireless access points

Options

- GE-DCARD-ESW-This optional 10/100/1000BaseT Gigabit Ethernet port for NM-16ESW and NM-16ESW-PWR can be used for a single gigabit connection for a file server or for intra-chassis stacking of the Cisco EtherSwitch Network Module. Stacking is supported in IOS Release 12.2(11)T and requires the use of the gigabit ethernet port.
- PWR-Chassis-360W—The power chassis is an external chassis that comes with a single 360W power supply, which can provide in-line phone power for up to 36 IP phones. Also included is a custom cable that connects the power supply to the Cisco EtherSwitch Network Module. The power chassis has a total of four slots and can have up to three additional 360W power supplies installed to provide for power redundancy options. The in-line power works over standard Category 5 unshielded twisted-pair (UTP) cable up to 100 meters and allows direct power instead of using wall power

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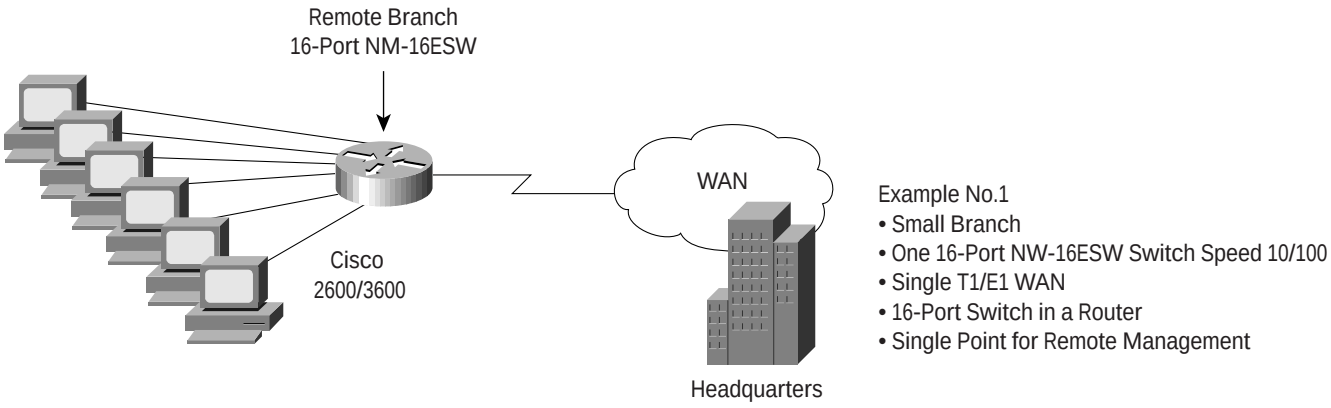
with a transformer. This allows customers to use existing Category 5 UTP installations. The Cisco EtherSwitch Network Module in-line power implementation passes the required U.S. and international safety regulations and compliance measures.

- NM-16ESW-PWR—The 16-port Ethernet switch network module with power daughter card supports in-line powering of IP telephones with –48V power when purchased with the external power chassis. This allows IP phones to be plugged into any port. Also, the integrated in-line power of the 10/100BaseTX autosensing ports provides DC power to devices that can accept power over traditional UTP cabling (such as the Cisco 7900 Family of IP phones). This allows a standard RJ-45 jack to be powered from this source rather than having a separate plug into an AC wall outlet. Delivery of –48V power must be made to the 16-port Ethernet switch.
- PPWR-PS-360W—This single 360W power supply for the Cisco EtherSwitch Network Module line power can be added to a power chassis to power additional IP phones or wireless access points. Each power supply supplies up to 360W and can power up to 36 IP phones.

Example Solutions

Figure 3 Typical Deployments: Small Branch Data Only



Small Branch Data Only

A Cisco EtherSwitch Network Module in a branch data deployment provides the flexibility of integrated routing and switching functions in one unit for low port densities. This deployment provides high-speed connections between individual desktops, servers, and other network resources in a single unit for Layer 2 and allows WAN connection at Layer 3 through the router. The Cisco EtherSwitch NM and Cisco 2600 router also provide an ideal solution for Cisco 2505, 2507, and 2516 users whose requirements have expanded beyond the existing Cisco 2500 Router/hub capabilities.

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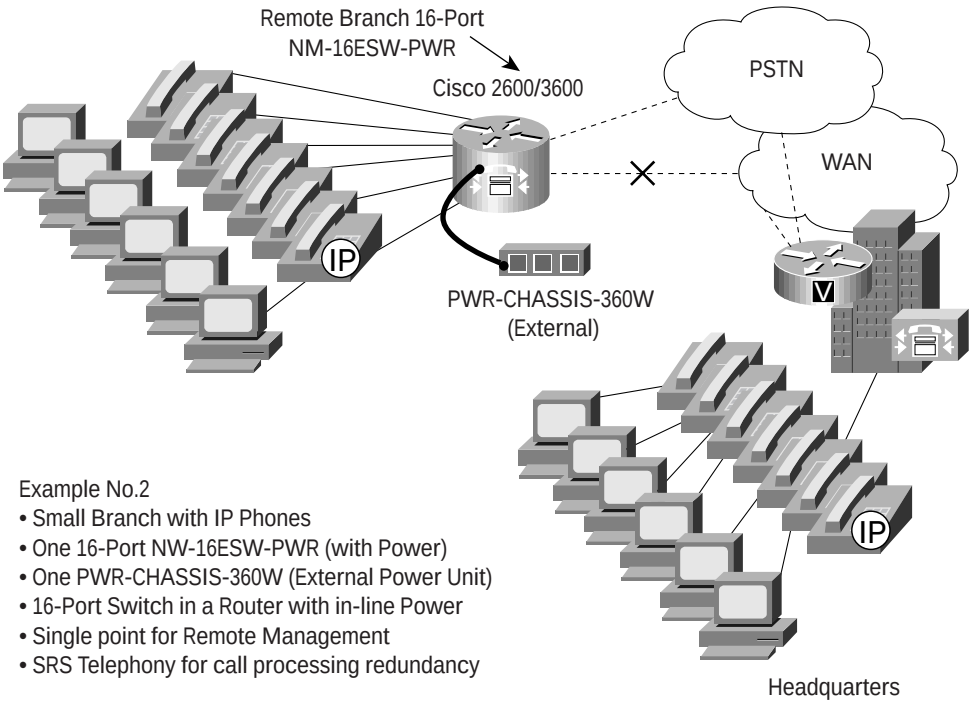
Figure 4 Typical Deployment: Small Branch Data and IP Phones



Small Branch Data and IP Phones

The Cisco EtherSwitch Network Module combined with analog or digital voice modules for the Cisco 2600/3600/3700 series routers provide a small branch office infrastructure for IP Telephony deployments. This solution can be combined with Cisco CallManager IP Telephony and the Cisco IOS Survivable Remote Site Telephony (SRS Telephony) solution. SRS Telephony runs on the local branch office router allowing it to automatically detect a failure in the network, and initiates a process to intelligently auto-configure the router to provide call-processing backup redundancy for the IP phones in that office.

The Cisco EtherSwitch NM with the external power chassis provides IP Phone power and phone discovery for IP phones. In addition, the Cisco EtherSwitch NM supports automatic VLAN configuration for IP Phones. The auxiliary VLAN feature allows network administrators to segment phones into separate logical networks even though the data and voice infrastructures are physically the same. The phone discovery allows the EtherSwitch NM-16ESW-PWR to automatically detect the presence of an IP phone and supplies in-line power.

For more information on the voice features for the Cisco 2600/3600/3700 series routers, visit:

Cisco 2600 Series: http://www.cisco.com/en/US/products/hw/routers/ps259/index.html

Cisco 3600 Series: http://www.cisco.com/en/US/products/hw/routers/ps274/index.html

Cisco 3700 Series: http://www.cisco.com/en/US/products/hw/routers/ps282/index.html

Data Communications Networks (DCN)

Another unique application of the Cisco EtherSwitch NM with Cisco 2600/3600 routers is in a Cisco DCN (Data Communications Network) operations and facilities management solution. The Cisco DCN solution can be deployed using Cisco routers and Catalyst switches and delivers an out-of-band network used by service providers and large enterprises for managing their primary network. By integrating the routing and switching functionality into one form factor, service

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providers and enterprises can achieve a cost-effective solution for their facilities management, monitoring and billing applications. The benefit is the reduction in valuable floorspace use as well as the advantages of reduced management, maintenance and training costs.

Software for the Cisco EtherSwitch Network Modules for the Cisco 2600/3600 Series

The Cisco EtherSwitch NM is supported on Cisco IOS Software Releases 12.2(2)XT and greater versions only for the Cisco IOS 2600/3600 Series Software. DCN applications for the Cisco 16-port etherswitch also require a Plus feature image. Table 2 gives software requirements for the Cisco IOS 2600/3600 Series Software, Table 3 gives memory requirements, and Table 4 gives product numbers and descriptions.

Table 2 Product Number and Description

Cisco Product Number	Description
NM-16ESW (=)	One 16-port 10/100 Cisco EtherSwitch Network Module with (optional) Gigabit Ethernet
NM-16ESW-PWR (=)	One 16-port 10/100 Ethernet switch with power card with (optional) Gigabit Ethernet
GE-DCARD-ESW (=)	One 1000BaseT daughter card for Cisco EtherSwitch Network Module
PWR-CHASSIS-360W (=)	External chassis for Cisco EtherSwitch NM; includes one 360W (which supports up to four total)
PPWR-PS-360W (=)	360W power supply for Cisco EtherSwitch Network Module line power
CAB-PPWR-PS1-1 (=)	Externally connects one Cisco EtherSwitch Network Module power supply to one Cisco EtherSwitch 16-/36-Port Network Module
CAB-PPWR-PS1-2 (=)	Externally connects one Cisco EtherSwitch Network Module power supply to two Cisco EtherSwitch network modules
CAB-PPWR-PS2-1 (=)	Externally connects two Cisco EtherSwitch power supplies to one Cisco EtherSwitch Network Module (redundant power)
PPWR-PS-CHASSIS (=)	External chassis with four open slots for PPWR-PS-360W
PPWR-DCARD-16ESW=	One power daughter card for 16-port EtherSwitch Network Module

Table 3 Software Requirements

Cisco Part Number	Cisco IOS 2600 Series Software	Cisco IOS 3600 Series Software
NM-16ESW (=)	Cisco IOS 12.2(2)XT or greater	Cisco IOS 12.2(2)XT
NM-16ESW-PWR (=)	Cisco IOS 12.2(2)XT	Cisco IOS 12.2(2)XT
GE-DCARD-ESW (=)	Cisco IOS 12.2(2)XT	Cisco IOS 12.2(2)XT
PWR-CHASSIS-360W (=)	Cisco IOS 12.2(2)XT	Cisco IOS 12.2(2)XT

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Table 4 Memory Requirements for Cisco 2600/3600 Series (Cisco IOS 12.2(2)XT)

Product Name 2600/3600/3660	Image Name	Software Image	Required Flash Memory 2600/3620/3640/ 3660	Required DRAM Memory 2600/3620/3640/ 3660
S26/362/364/366 CP-12202XT	IOS IP PLUS	C2600/3620/3640/3660 -is-mz	16/16/32/32	64/64/64/64
S26/362/364/366 BP-12202XT	IOS IP/IPX/AT/DEC PLUS	C2600/3620/3640/ 3660-ds-mz	16/16/32/32	64/64/64/64
S26/362/364/366 CK8 12202XT	IOS IP PLUS IPSEC 56	C2600/3620/3640/3660 -ik8s-mz	16/16/32/32	64/64/64/64
S26/362/364/366 CK9-12202XT	IOS IP PLUS IPSEC 3DES	C2600/3620/3640/3660 -ik9s-mz	16/16/32/32	64/64/64/64
S26/362/364/366 CHK9-12202XT	IOS IP/FW/IDS PLUS IPSEC 3DES	C2600/3620/3640/3660 -ik9o3s-mz	16/16/32/32	64/64/64/64
S26/362/364/366 AP-12202XT	IOS ENTERPRISE PLUS IPSec 3DES	C2600/3620/3640/3660 -js-mz	16/32/32/32	64/64/96/96
S26/362/364/366 AK9-12202XT	IOS ENTERPRISE PLUS IPSec 3DES	C2600/3620/3640/3660 -jk9s-mz	16/32/32/32	64/64/96/96
S26/362/364/366 AHK9-12202XT	IOS ENTERPRISE PLUS FW/IDS PLUS IPSEC 3DES	C2600/3620/3640/3660 -jk9o3s-mz	16/32/32/32	64/64/96/96
S26/362/364/366 APU-12202XT	IOS ENTERPRISE PLUS/ H323 MCM	C2600/3620/3640/3660 -jsx-mz	16/32/32/32	64/64/96/96

Specifications

- Standards network protocols
- Ethernet: IEEE 802.3, 10BaseT
- Fast Ethernet: IEEE 802.3u, 100BaseTX
- Fast Ethernet: IEEE 802.3, 100BaseFX
- IEEE 802.1D Spanning-Tree Protocol
- IEEE 802.1p CoS
- IEEE 802.1Q VLAN
- Gigabit Ethernet: IEEE 802.3z, IEEE 802.3x, IEEE 802.3ab
- Dimensions and Weight of NM-16ESW and NM-16ESW-PWR:
  - Dimensions (H x W x D): 1.55 x 7.10 x 7.2 in.
  - Weight: 2 lb maximum
- Dimensions and Weight of PPWR-PS-CHASSIS:
  - Dimensions (H x W x D): 17.1 X 3.50 X 12 in.
  - Weight: 11lb maximum

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- Environmental
  - Operating humidity: 5 to 95%, noncondensing
  - Operating temperature: 32 F to 104 F (0 C to 0 C)
  - Nonoperating temperature -40 F to185 F (-40 C to 85 C)

Regulatory Compliance, Safety, EMC, Telecom, Network Homologation

When installed in a Cisco 2600/3600 Router, the Cisco EtherSwitch Network Module does not change the standards (regulatory compliance, safety, EMC, telecom, network homologation) of the router itself. See data sheets for the Cisco 2600/3600 routers at:

http://www.cisco.com/warp/public/cc/pd/rt/2600/prodlit/2600_ds.htm

http://www.cisco.com/warp/public/cc/pd/rt/3600/prodlit/36002_ds.htm

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